Wendy Li-Wen Mao

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EDUCATION

University of Chicago, Chicago, IL
Ph.D. candidate in the Department of the Geophysical Sciences. Fall ’01-Current.
McCormick Fellowship.

Massachusetts Institute of Technology, Cambridge, MA
Ph.D. candidate in Materials Science and Engineering, Fall ’98-Winter ‘01.
Draper Fellowship.

Massachusetts Institute of Technology, Cambridge, MA
Bachelor of Science in Materials Science and Engineering, May 1998.
Graduated Phi Beta Kappa.
Member of Tau Beta Pi, a National Engineering Honor Society.
Member of Alpha Sigma Mu, a National Materials Science Honor Society.

EXPERIENCE

Department of the Geophysical Sciences, **University of Chicago**, Chicago, IL
Fall ’01-Current. Research assistant. Advisor: Prof. Dion Heinz
High pressure-high temperature x-ray diffraction, hydrostatic x-ray diffraction, radial x-ray diffraction, nuclear resonant inelastic x-ray scattering, non-resonant inelastic x-ray scattering, and ultrasonic studies in diamond anvil cells of materials relevant to the Earth’s deep interior using diamond anvil cells.

Geophysical Laboratory, **Carnegie Institution of Washington**, Washington, D.C.
Winter ’01-Current. Predoctoral fellow.
Raman and IR spectroscopy, x-ray and neutron diffraction studies of simple molecular systems (e.g. H2-H2O, H2-CH4). High pressure-high temperature studies of K-hollandite using multi-anvil press and electron microprobe analysis. X-ray diffraction and inelastic scattering studies of graphite under pressure.

National School on Neutron and X-ray Scattering, **Argonne National Laboratory**, Argonne, IL
Summer ‘99. Scholarship student.
Studied the principles of neutron and x-ray scattering theory. Applied information on scattering methods to experiments at the Advanced Photon Source and the Intense Pulsed Neutron Source.

Electrical Engineering and Computer Science Department, **MIT**, Cambridge, MA
Fall ‘98-Winter ‘01. Research assistant. Advisor: Prof. Rafael Reif.
Graduate research being conducted in the Microsystems Technology Laboratory at MIT on dc magnetron sputtering of low stress piezoelectric AlN thin films for use in chemical sensors and other MEMS applications. This work was completed in conjunction with Draper Laboratory.

Spire Corporation, Bedford, MA
Summer ‘98. Research associate. Advisor: Dr. R. Sudharasan.
Fabrication and testing arrays of thin film CdTe X-ray detectors for use in CT scanners.

Electrical Engineering and Computer Science Department, **MIT**, Cambridge, MA
Winter ‘97-Fall ‘97. Research assistant. Advisor: Prof. Henry I. Smith.
Sputter deposition of low stress Ta-B films onto x-ray masks. Processed these masks for use in building nanostructure devices.

Materials Science and Engineering Department, **MIT**, Cambridge, MA
Summer ‘96. Research assistant. Advisor: Prof. Linn Hobbs.
Prepared samples of zirconium and its oxide for TEM analysis of the metal-oxide interface for possible use in total joint arthroplasties.

Nuclear Engineering Department, MIT, Cambridge, MA
Summer ’95. Research assistant. Advisor: Prof. Xiao-Lin Zhou.
Conducted experiments using the neutron reflectometer in the MIT nuclear reactor. Helped design a new neutron reflectometer using AutoCAD.

PUBLICATIONS

W. L. Mao, D. L. Heinz, G. Shen, A. J. Campbell, J. M. Devine, Laser-heating of Fe-Ni alloys, in preparation.

W. L. Mao, V. V. Struzhkin, H-k. Mao, and R. J. Hemley, P-T stability of the van der Waals compound (H2)4CH4, submitted to Chem. Phys. Lett.

A. Shahar, W. A. Bassett, H-k. Mao, I-m. Chou, and W. L. Mao, The stability of ikaite, CaCO3•6H2O, at high pressure and temperature, submitted to Amer. Mineral.

W. L. Mao, G. Shen, V. B. Prakapenka, Y. Meng, A. J. Campbell, D. L. Heinz, J. Shu, R. Hemley, and H-k. Mao, Ferromagnesian postperovskite silicates in the D’’ layer of the Earth, PNAS 101, 15867-15869, 2004.

K. Lokshin, Y. Zhao, D. He, W. L. Mao, H-k. Mao, R. J. Hemley, M. V. Lobanov, and M. Greenblatt, Structure and dynamics of hydrogen molecules in the novel clathrate hydrate by high pressure neutron diffraction, Phys. Rev. Lett., 93, 125503, 2004.

W. L. Mao, W. Sturhahn, D. L. Heinz, H-k. Mao, J. Shu, and R. J. Hemley, Nuclear resonant x-ray scattering of iron hydride at high pressure, Geophys. Rev. Lett. 31, doi:10.1029/2004GL020541, 2004.

W. L. Mao and H-k. Mao, Hydrogen storage in molecular compounds, PNAS 101, 708-710, 2004.

V. V. Struzhkin, H-k. Mao, W. L. Mao, R. J. Hemley, W. Sturhahn, E. E. Alp, C. L’Abbe, M. Y. Hu, and D. Errandonea, Phonon densities of states and elastic properties of Fe-based materials under compression, Hyperfine Interactions 153, 3-15, 2004.

W. L. Mao, H-k. Mao, C-s. Yan, J. Shu, J. Hu, and R. Hemley, Generation of ultrahigh pressures using single-crystal chemical-vapor-deposition diamond anvils, Appl. Phys. Lett. 83, 5190-5192, 2003.

W. L. Mao, H-k. Mao, P. J. Eng, T. P. Trainor, M. Newville, C-c. Kao, D. L. Heinz, J. Shu, Y. Meng, and R. Hemley, Bonding changes in compressed superhard graphite, Science 302, 425-427, 2003.

W. L. Mao, H-k. Mao, A. F. Goncharov, V. V. Struzhkin, Q. Guo, J. Hu, J. Shu, R. J. Hemley, M Somayazulu, and Y. Zhao, Hydrogen clusters in clathrate hydrate, Science 297, 2247-2249, 2002.

W. L. Mao, J. Shu, J. Hu, R. Hemley, and H-k. Mao, Displacive transition in magnesiowüstite, J. Phys.: Condens. Matter 14, 11349-11354, 2002.

J-f. Lin, D. L. Heinz, A. J. Campbell, J. M. Devine, W. L. Mao, and G. Shen, Iron-nickel alloy in the Earth's Core, Geophys. Rev. Lett. 29, doi: 10.1029/2002GL015089, 2002.

PRESENTATIONS

"Elastic anisotropy and texture of iron at high pressure," 2004 AGU Fall Meeting, San Francisco, CA, December 2004 (invited talk).

"Ferromagnesian post-perovskite silicates at D" conditions," 2004 AGU Fall Meeting, San Francisco, CA, December 2004 (oral presentation).

"Mineral physics at the core-mantle boundary," High Pressure Group Meeting, Argonne, IL, November 2004 (invited talk).

"Viewing planetary interiors through a diamond window," Division of Geological & Planetary Sciences Seminar Series, California Institute of Technology, CA, November 2004 (invited talk).

"Mineral physics at the core-mantle boundary," Mineral Physics Group Seminar Series, California Institute of Technology, CA, November 2004 (invited talk).

"Bonding changes in compressed superhard graphite," 2004 IUCr High Pressure Workshop, Saskatchewan, Canada, August 2004 (invited talk).

"Nuclear resonant x-ray scattering of iron hydride at high pressure," APS User Science Seminar, Argonne, IL, August 2004 (invited talk).

"Bonding changes in compressed superhard graphite," 2004 APS Users Meeting, IXS Workshop, Argonne, IL, May 2004 (invited talk).

"Hydrogen storage in molecular compounds," 2004 SSAAP Symposium, Albuquerque, NM, March 2004 (poster).

"Bonding changes in compressed superhard graphite," 2004 SSAAP Symposium, Albuquerque, NM, March 2004 (poster).

"High pressure elasticity of iron hydride from nuclear resonant inelastic x-ray scattering and x-ray diffraction," 2004 SSAAP Symposium, Albuquerque, NM, March 2004 (poster).

"High pressure elasticity of iron hydride from nuclear resonant inelastic x-ray scattering and x-ray diffraction," 2003 AGU Fall Meeting, San Francisco, CA, December 2003 (poster).

"Bonding changes in compressed superhard graphite," 2003 GSA Fall Meeting, Seattle, WA, November 2003 (poster).

"Hydrogen storage in molecular compounds," 2003 LANSCE User Group Meeting, Los Alamos Neutron Science Center, Los Alamos, NM, October 2003 (invited talk).

"Neutron study of hydrogen clathrate," 2003 COMPRES Meeting, Santa Cruz, CA, June 2003 (poster).

"Neutron study of hydrogen clathrate," 2002 AGU Fall Meeting, San Francisco, CA, December 2002 (poster).

"Hydrogen clusters in clathrate hydrate," LANL High-Pressure Seminar, Los Alamos, NM, November 2002 (invited talk).

“Hydrogen clusters in clathrate hydrate,” High Pressure Group Meeting, Argonne, IL, October 2002 (invited talk).

“Hydrogen clusters in clathrate hydrate,” 6th HPMPS, Verbania, Italy, August 2002 (poster).

“Hydrogen clusters in clathrate hydrate,” 10th International Conference on the Physics and Chemistry of Ice, Newfoundland, Canada, July 2002 (invited talk).

“Landau transition in magnesiowüstite,” AIRAPT-18, Beijing, China, July 2001 (invited talk).

AWARDS

Student Award, 2004 SSAAP Symposium, Albuquerque, NM, March 2004.
Outstanding Student Award, 6th HPMPS, Verbania, Italy, August 2002.

GRANTS

“Hydrogen Storage in Novel Molecular Materials,” P.I.’s: Viktor V. Struzhkin ,Wendy L. Mao, Burkhard Militzer, Ho-kwang Mao, and Russell J. Hemley, DOE Grand Challenge for Basic and Applied
Research in Hydrogen Storage.

PATENTS

“Composition and method for hydrogen storage,” W. L. Mao and H-k. Mao. Patent No. 6,735,960.

SKILLS

Computer Skills: Microsoft Office, AutoCAD, Fit2D, Peakfit, GSAS.
Familiarity with C, FORTRAN, Maple, MATLAB, IDL.
Languages: Fluent in English and Chinese. Familiarity with German.

TEACHING EXPERIENCE

Teaching assistant for the following courses:
Atmospheric Chemistry and Air Quality. Instructor: Prof. John Frederick.
Origin and Evolution of the Earth and Solar System. Instructor: Profs. Frank Richter and Munir Humayun.
Physics of the Earth. Instructor: Prof. Dion Heinz.

MEMBERSHIPS

Americal Geophysical Union
Geological Society of America